Sec. 26.575.150. Outdoor Lighting Standards

26.575.150.010 Intent and Purpose

(a) *Background:* As the global population continues to grow, a larger percentage of people are living in urban environments, leading to expansion and development. In 2007, the global urban population exceeded the global rural population for the first time in history. In North America, 82% of people live in urban areas.

One problem associated with population growth and urban sprawl is the use of artificial light at night. This issue was first identified in the 1970's, when astronomers detected a degradation of the night sky. Continued increase in the quantity of high angle and uncontrolled reflected light has diminished the dark sky. For most of the U.S. population, a clear view of the stars is no longer possible.

Excessive, poorly designed, or poorly installed lighting at night create harms beyond skyglow, wasted energy, and unsafe or unpleasant conditions. Irresponsible light at night can also be harmful to the ecological health of flora, fauna, and humans. The City of Aspen is not excluded from this conundrum and pitfall. Aspen is a unique town situated in a natural environment. Darkness is as much a part of that natural environment as the trees, animals, and mountains. It is currently an endangered resource. Unnecessary lighting of natural and semi-natural areas impedes our ability to connect to that natural environment after dark, from being unable to see the stars to becoming estranged from the wildness that makes Aspen such a special place.

(b) *Purpose:* As a global citizen, the City of Aspen believes in the ancestral right for residents to access dark skies and be free from irresponsible lighting distractions at night. When the need for darkness conflicts with people's need for light, the City of Aspen believes good lighting design can find a workable balance between safety, aesthetics, human health, and the ecological / environmental impacts.

The City of Aspen understands some exterior lighting is appropriate and necessary for the safety of people at night. What to light, why, and when, will be a cornerstone of this lighting ordinance. Because the effects of light pollution can persist as far as 200 kilometers (120 miles) from the source, local control and regional coordination is encouraged for dark sky preservation and ecological protection. The following principles are used as a guide for responsible lighting design in the City of Aspen:

(1) Useful – All lighting at night should have an intended purpose

(2) Targeted – Light should be directed only where it is needed

(3) Low Light Levels – Light should be no brighter than necessary for the task

(4) Controlled – Lighting should only be used when it is useful

(5) Spectrum – Limit the amount of harmful short wavelengths (blue-violet)

(c) *Goals:* In addition to the forementioned principles for responsible lighting design, the following goals are intended to guide Aspen decision makers regarding artificial exterior light at night:

(1) Use ANSI/IES exterior illuminance recommendations to reduce pedestrian accidents and promote the health, safety, and welfare of people;

(2) Reduce obtrusive and glaring light that inhibit human vision and detract from enjoyment;

(3) Curtail light pollution, reduce sky glow metrics, improve the nighttime environment for residents, visitors, and astronomer enthusiasts;

(4) Prevent inappropriate and poorly designed or installed outdoor lighting;

(5) Protect local and migrating ecological systems from the adverse effects of artificial light.

(6) Prevent light trespass from unnecessarily disturbing people (and their sleep patterns) and from unnecessarily restricting access to nighttime darkness as a natural resource.

26.575.150.020 Lighting Zone Planning, Cross-Reference, and Establishment

(a) *Background:* Introduced in the late 1990's, lighting zones are a municipal planning tool to help reduce light levels, light pollution, wasted energy, and neighborly conflicts arising from excessive or poor use of light at night. Lighting zones can achieve these goals because they leverage the adaptation of human vision in low light levels, enabling lighting solutions based on ambient conditions rather than brightly lit adjacent properties.

Knowing what to light, or not light, is an important consideration for the nighttime environment. Having a hierarchy of planned lighting can add context and visual order, improve coherency and understanding of one's surroundings, and ultimately give a pedestrian the confidence to engage with outdoor space at night. Avoiding visual distractions and glare are also key considerations for improving nighttime vision of residents, pedestrians, and motorists. This ordinance will leverage the following guidance from the American National Standards Institute (ANSI), the Illuminating Engineering Society (IES), and the International Dark Sky Association (IDA):

(1) ANSI/IES LP-2 Designing Quality Light for Exterior Environments

(2) ANSI/IES RP-43-22 Lighting Exterior Applications

(3) ANSI/IES LP-11-20 Environmental Conditions for Outdoor Lighting

(4) Model Lighting Ordinance, 2011

(b) *Definitions:* Officially defined within *ANSI/IES LP-11-20 Environmental Conditions for Outdoor Lighting*, lighting zones are briefly defined here:

(1) LZ0 – No Ambient Light (wilderness, protected parks, preserves)

(2) LZ1 – Low Ambient Light (rural, residential, developed park areas)

(3) LZ2 – Moderate Ambient Light (office, commercial, mixed use, schools, light industrial)

(4) LZ3 – Moderately High Ambient Light (central business, play fields, heavy industrial)

(c) *Purpose:* Lighting zone designations have been adopted by, and are referenced in, major building, energy, and outdoor lighting code standards. They allow for illuminance recommendations regarding what to light and at what intensity based on the expected activities. Assigning these designations within the City of Aspen is essential to reference and use ANSI/IES recommendations for exterior lighting.

(d) *Goals:* Lighting zone designations should not be based on existing conditions, but rather the type of environment the municipality seeks to achieve. Unless otherwise mentioned, the City of Aspen will have no Lighting Zone 4 applications.

(e) *Designations:* Lighting zones are most effective when they coordinate with, and overlay on, land use zones and their associated tasks. Here is a link to where the land use zone map for the City of Aspen can be accessed, https://www.aspen.gov/194/Planning-and-Zoning. Planned Developments (PDs) with adopted outdoor lighting regulations and City of Aspen parks are not included in a lighting zone. Lighting zone designations will cross reference to the land use codes as follows:

(1) Lighting Zone 0 (LZ0): OS, WP, and the Hallam Bluff and Stream Margin Environmentally Sensitive Areas.

(2) Lighting Zone 1 (LZ1): C, Residential Zone Districts, and PDs without adopted outdoor lighting regulations.

(3) Lighting Zone 2 (LZ2): CC, C-1, NC, MU, SCI, L, CL, SKI

(4) Lighting Zone 3 (LZ3): Only available for temporary uses or special permit categories.

26.575.150.030 Applicability

(a) *Applicability:* The lighting requirements of this ordinance shall be applicable to all exterior lighting on private property within the City of Aspen. Existing outdoor lighting that does not meet the provisions of this ordinance shall be considered legal nonconforming for five (5) years from the adoption date of this ordinance. After five (5) years, or unless otherwise specified within this ordinance, all outdoor lighting fixtures that do not conform to the requirements of this ordinance must be replaced or retrofitted to meet compliance. Violations shall be corrected within ninety (90) days of being cited.

(1) *Routine Maintenance and one-for-one replacement:* In the event an outdoor light fixture is not working or damaged, the repair/replacement shall conform with the requirements of this ordinance.

(2) *Renovations and Modifications:* Renovations and modifications that qualify as an IEBC Alteration Level 3 on an existing property (e.g. square footage, occupant capacity, parking spaces) shall cause the entire property to meet the requirements of this ordinance. Any re-zoning or change of use shall also constitute meeting the requirements of this ordinance.

(3) *New Development:* All new development shall meet the requirements of this ordinance.

(b) *Exemptions:* The following types of lighting installations shall be exempt from the requirements within this ordinance.

(1) *Lawful:* Lighting required by federal, state, county, township, municipal, or other territorial laws or regulations that conflict with this ordinance will supersede and be exempt.

(2) *Flags:* When possible, lower and remove flags from sunset to sunrise so illumination is not needed. For flags displayed at night, nighttime illumination of the United States of America flag and the Colorado State flag is allowed. Nighttime illumination of other flags is not allowed. Guidelines are:

a. For an even distribution of light on the flag surface when fully extended, use either top of pole downward directed light, a maximum of three (3) in-ground uplights, or three (3) shielded spotlights that are surface mounted at grade. To preserve the night sky, top of pole downward directed lights are encouraged.

b. In-ground and surface mounted shielded spotlights should be narrow beam (15 degree maximum), no more than 100 lumens per foot of height (e.g. 2500 lumens per light for a 25 foot tall flag), with point sources of light not be visible outside of a 15-foot radius. Surface mounted lights should rotate and tilt and they aimed to hit the flag.

(3) *Street and Roadway:* Lighting installed within the public right-of-way or an easement that is for the benefit of public safety such as emergency, traffic control, and streetlights is addressed in more detail within a separate ordinance. Lighting installed within the public right-of-way with a purpose of illuminating outside the public right-of-way is not exempt from the requirements of this ordinance.

(4) *Signage:* The lighting of signage is addressed within Section 26.510 of the City of Aspen's Municipal Code.

(5) *Seasonal Lighting:* Seasonal lighting of a temporary nature is allowed between (November ## and March ##?). Seasonal lighting must not create dangerous glare on adjacent streets or properties, must be maintained in an attractive condition, and must not constitute a fire hazard. Multicolored lighting is acceptable. When seasonal lighting is white, it shall not exceed a CCT of 4000K.

a. Holiday lighting that occurs outside of winter seasonal lighting in Aspen and that is associated with any recognized national or religious holiday may be illuminated up to two weeks prior to the observed holiday date and extinguished within two days after the holiday occurs.

- All of a site's seasonal or holiday lighting must remain within the relevant site lumen limit allowances shown in Table 2 or Table 4.

b. When seasonal or holiday lighting occurs within or directly adjacent to an Environmentally Sensitive Area it shall be subject to additional restrictions.

- Seasonal or holiday lighting involving an ESA is not exempt from City Curfew. Lighting must be extinguished between 11 pm and 6 am.
- All of a site's seasonal or holiday lighting must remain within the relevant site lumen limit allowances shown in Table 2 or Table 4.

c. This section is not intended to encompass regulations for strip lighting or string lighting such as bistro or ping-pong lights.

(6) *Other:* If a lighting plan, fixture, or installation are proposed that do not meet the requirements of this ordinance, but have a demonstrable community benefit, an exemption may be considered. The applicant shall submit additional information so the benefit to the community can be evaluated, and the lighting may then be approved by the Community Development Director.

a. This process would apply to outdoor art installations involving lighting.

b. It may also apply to some taller structures, such as a clock tower in a public area.

26.575.150.040 Submittal Process

(a) *Planning Request:* Lighting plans for new development or renovations must be submitted to the Community Development Department for approval. Either method described is acceptable.

(1) *Prescriptive Method:* For administrative simplicity, a small project may be charted using a spreadsheet containing identification for each luminaire type, quantity, lumen output, BUG rating for luminaires, the total expected site lumens, and then a calculated total site lumens compared to the total site lumen allowance listed in Section 26.575.150.060, Residential Lighting or Section 26.575.150.070 Non-Residential Lighting.

a. A sub-total is required for the total lumens coming from partially shielded light (e.g. tree, landscape, sculpture, and some wall or façade light) allowed in Table 2 – Total Site Lumens Allowed: Residential UsesTable 2 – Total Site Lumens Allowed: Residential Uses or Table 3 (non-residential), which cannot exceed 20% of the allowable lumens.

b. Supporting data sheets for exact luminaires (model numbers), light distribution plots, fixture BUG ratings, luminaire locations, mounting heights, and aiming directions should be included.

(2) *Performance Method:* For larger and more complex projects, an outdoor lighting design can be analyzed using industry standard lighting software. This outdoor lighting plan shall include:

a. Luminaire locations, mounting heights, aiming directions, IES photometric data, buildings, and other physical objects within the site.

b. The average illuminance (in footcandles or lux) for any one task should not exceed ANSI/IES standards for the applicable lighting zone, including but not limited to:

- Façade, building entrance, porte cochere, softscape, perimeter barriers

- Walking paths adjacent to architecture, hardscape, exits, landscape, waterfront, stairs, and ramps.
- Patios, outdoor dining, decks, terraces, pools, and pool decks.

c. The analysis shall utilize an enclosure comprised of calculation planes with zero reflectance values around the perimeter of the site including a top plane no less than 33 feet (10 meters) above the tallest luminaire. The illuminance on the calculation planes must not exceed the limits of light trespass defined within this ordinance.

(3) A compliance statement must verify the outdoor lighting plan meets the requirements of the ordinance.

(b) *Review:* Site lighting plans shall be subject to review and approval by City of Aspen Community Development. Site lighting plans submitted as a part of a building permit application shall be reviewed administratively by the Community Development Director. The Director shall have the authority to refer an application to the Planning and Zoning Commission or the Historic Preservation Commission if deemed appropriate.

(c) *Appeals:* An appeal made by an applicant aggrieved by a decision made by the Community Development Director regarding administration of this Chapter may appeal such decision to the City Council, pursuant to Chapter 26.316, Appeals. Other administrative remedy may be available pursuant to C.R.S. § 31-23-209.

26.575.150.050 Light Trespass

(a) *Background*: Light trespass refers to measurable light extending beyond the boundary of its intended usage area. This causes annoyance, loss of privacy, or other nuisances. In Aspen, it is a major source of frustration about lighting in neighborhoods. Often light trespass is referring to outdoor lighting, but light spilling outdoors through windows or other translucent surfaces in a façade also contributes to light trespass.

(b) *Requirements:* All outdoor light sources in Aspen shall be located and optically cutoff or shielded such that the point light source shall not be visible from adjacent property or streets. Whenever possible, interior point light sources should not be visible from outdoors and must not be visible at the property line during hours of curfew. Unless permitted otherwise by Aspen, the maximum illumination at any point along the property line (measured at grade with the light meter aiming upward) shall not exceed the requirements listed below.

Property Line Light Trespass: Illuminance Limits				
	LZ0	**LZ1**	**LZ2**	**LZ3**
Footcandles (fc)	0.05	0.1	0.3	0.8
Lux (lx)	0.5	1	3	8

Table 1 - Property Line Light Trespass: Illuminance Limits. Measured in footcandles or lux.

Meeting these requirements will likely require mounting locations 2.5 times the luminaire height away from any property lines. Additional distance or shielding will likely be required for lighting installed along ridgelines or hillsides.

(c) *Measurements*: To measure light trespass for any property in Aspen, a light meter should be placed at grade and aimed upwards at any point along the property line. Any location a measurement is taken along the property line should meet the criteria in Table 1.

(1) The illuminance trespass limits shown in *Table 1* are for use with single property line (e.g. a property line adjacent to ROW or open space). The values shown will double when the property line is being shared by two lit properties.

(2) The property line can be considered five feet beyond actual when bordering with public walkways, bikeways, plazas, and parking lots.

26.575.150.060 Requirements for All Outdoor Lighting

(a) *Conformance:* All outdoor lighting shall meet the requirements of this ordinance, applicable electrical and energy codes, and applicable sections of building code.

(b) Responsible Design Criteria:

(1) *Correlated Color Temperature (CCT):* In an effort to minimize potentially disruptive and/or harmful spectrum at night, the City of Aspen has a standard CCT of 2700K up to a maximum of 3000K. A CCT of 2200K is allowed provided the Color Rendering Index (CRI) is greater than 65.

(2) *Direct Uplight:* Unless otherwise allowed, all light sources shall be fully shielded and possess a U0 rating (IES TM-15) for zero uplight. Luminaires must be constructed in such a manner that all light emitted by the luminaire, either directly from the light source or diffusing element, or indirectly by reflection or refraction from any part of the luminaire, is projected below the horizontal.

(3) *Poles:*

a. Bollard, Pathway, or Post-Top lighting taller than 36 inches is prohibited within residential zones.

b. Pole mounted lighting within multi-family common areas or any parking lot adjacent to residential use are limited to 12 feet tall.

c. Pole mounted lighting for non-residential parking lots is limited to 20ft tall, provided it is not directly adjacent to a residential property and does not exceed light trespass limits.

(4) *Curfew:* Based on human activity, outdoor lighting curfew in the City of Aspen shall be established as 11:00 p.m. until 6:00 a.m. unless otherwise specified. All outdoor lighting shall be turned off between 11:00 p.m. and 6:00 a.m. except for the following:

a. Street, roadway, and other Department of Transportation lighting.

b. Code required lighting for public steps, stairs, walkways, and building entrances.

c. Other special use or permitted exceptions listed within this ordinance such as flag, seasonal, sports fields, and businesses which operate during these hours; such lighting may remain illuminated only while the establishment is actually open for business.

(c) *Prohibitions:* The following types of exterior lighting sources, fixtures and installations, and those interior lighting sources, fixtures, and installations that can be seen directly from the exterior by the public or are causing light trespass or direct glare into any public right-of-way, property, or building, shall be prohibited in the City of Aspen.

(1) Mercury vapor lighting shall be prohibited.

(2) Inefficient light sources (efficacy less than 45 lumens per watt) shall be prohibited for outdoor use.

(3) Blinking, flashing, moving, revolving, scintillating, flickering, changing intensity and changing color lights shall be prohibited.

(4) Unshielded floodlights are prohibited, and shielded floodlights are limited not to exceed 1,260 lumens.

(5) Lighting directed towards the Roaring Fork River, Maroon Creek, Castle Creek, Hallam Lake, or any other waterway is prohibited as the lighting of natural waters at night can damage freshwater ecosystems and reduce biodiversity.

(6) No outdoor lighting may be used in any manner that could interfere with the safe movement of motor vehicles on public thoroughfares. The following is prohibited:

a. Any permanent light source not intended for roadway illumination that still produces direct light or glare onto a roadway that could be disturbing to the operator of a motor vehicle (e.g. pedestrian architectural lighting, landscape lighting).

b. Any light that may be confused with or construed as a traffic control device except as authorized by State, Federal or City government.

(7) Aerial lasers, beacons, and searchlights are prohibited except for emergency use.

26.575.150.070 Residential Lighting

(a) *Background*: Lighting in residential areas provides for safe navigation to and from residences at night, visual character, and the ability to enjoy outdoor spaces in hours of darkness. Lighting facades, landscaping, and peripheral boundaries of a residential property allows residents and guests to stay oriented within a space, which fosters an improved sense of safety and wellbeing. Any points of ingress or egress can also benefit from quality lighting for both wayfinding and threat detection. Vertical illuminance plays a critical role in addressing this need, allowing movement in silhouette or shadow to be easily detectable.

Effective lighting for these needs should be unobtrusive, avoid creating glare, and avoid excessive light which can harm the health of people, wildlife, and landscaping. For this reason, maximum limits on lumens per site and hours of curfew apply to all residential properties in Aspen. Additional guidelines are as follows:

(b) *Light Output:* The upper lumen limits listed below should not be the design goal. The design goal should be to use the minimum light levels that meet the requirements of the task. The total allowable site lumens (initial) for a residential property are limited to:

Total Site Lumens Allowed: Residential Uses		
Gross Lot Area (Square Feet)	**LZ1**	**LZ2**
15,000+ sf	6,000	n/a
9,000 sf	3,000	5,000
6,000 sf	2,000	4,000
4,500 sf	2,000	4,000
< 3,000 sf	1,500	3,000

Table 2 – Total Site Lumens Allowed: Residential Uses. Measured in lumens.

(1) An additional 3,000 lumens for each additional Dwelling Unit is allowed on properties larger than 1 acre.

(2) An additional 300 lumens per parking lot space is allowed for Multi-Family developments.

(c) *Light for Orientation and Reassurance:* Vertical illuminance plays a critical role in allowing people to perceive the spatial perimeter and major obstacles in an area, as well as detect movement. This allows people to feel more confident navigating a space and also allows for threat detection at night, especially in lower-activity residential areas. The design standards for this kind of lighting are detailed below.

(1) *Façade Lighting:*

a. Façade lighting placed so it enters the residential windows of multi-family and mixed-use properties is prohibited to prevent unwanted light at night.

b. Interior light escaping through windows is also seen vertically from the exterior perspective. No point light source should be visible from the property line during hours of curfew.

(2) Trees, Gardens, and Landscape Lighting:

a. Tree and landscape lighting is only allowed within 25 feet of a residence or drive entrance.

b. Tree and landscape lighting must be turned off during hours of curfew.

(3) *Walls, Fences, and Perimeter Barriers:*

a. Perimeter fence lighting is prohibited within single, two, tri, quad, or manufactured housing properties zoned for residential use.

b. Illumination of walls shorter than five feet and directly beneath them is allowed within high density and mixed use residential common areas, provided they are washed using approved façade or landscape lighting techniques and meet all the other requirements of this ordinance.

Shielded luminaires for are permissible for these uses only if the light distribution is limited to the targeted element (e.g., façade, sculpture, shrub), and if the total amount of partially shielded light does not exceed 20% of the total site lumen allowance or the individual luminaire limits listed below.

Shielded Luminaire Limits				
Luminaire Type	**LZ0**	**LZ1**	**LZ2**	**LZ3**
Low Voltage Landscape	n/a	205	430	525
Shielded In-grade Uplight	n/a	455	910	1,820
Partially Shielded Flood	n/a	630	1,260	2100
Fully Shielded U0 Down	n/a	630	1,260	2,100

Table 3 – Shielded Luminaire Limits. Measured in lumens.

(d) Light for Wayfinding, Pathways, and Stairs: Changes in grade or terrain are more hazardous when visibility is poor. Stairways, curbs, raised pavement, potholes, and slippery surfaces are all examples of possible trip and fall hazards that can require lighting at night to navigate to or from a residence safely. The design standards for this kind of lighting are detailed below.

(1) *Driveway and Parking:* Driveway and parking lot lighting for single, two, tri, quad, or manufactured housing properties zoned for residential use is not permitted.

(2) *Entrances and Porte Cocheres:* Porte cochere and covered porch lighting is allowed. Luminaires mounted shall be aimed downward and installed such that the bottom of the luminaire or lens, whichever is lower, is recessed or fully cutoff and not producing any light above horizontal. All light emitted by an under-canopy fixture shall be substantially confined to the posts, façades, and ground surface directly beneath the perimeter of the canopy.

(3) *Pathways, Stairs, and Steps:* This lighting shall be no taller than thirty-six (36) inches and fully shielded.

(e) *Light for Atmosphere and Enjoyment:*

(1) Artificial lighting used to illuminate patios, above grade decks, balconies, or gazebos must be fully shielded with the point light source not visible beyond the property line in which it is located.

(2) Art, monuments, and fountain features may be illuminated if they are adjacent (i.e. within 10 feet) to the residential structure. This lighting must be turned off during hours of curfew.

26.575.150.080 Non-Residential Lighting

(a) *Background*: Lighting in non-residential areas provides for safe navigation to and from businesses and activities at night, adds visual character, and allows for shopping and recreation in hours of darkness. Lighting facades, landscaping, and peripheral boundaries of non-residential spaces allows residents and visitors to Aspen to stay oriented within a space, which fosters an improved sense of safety and wellbeing. Any points of ingress or egress for non-residential spaces can also benefit from quality lighting for both wayfinding and threat detection. Vertical illuminance plays a critical role in addressing this need, allowing movement in silhouette or shadow to be easily detectable. It also helps to define spatial boundaries in busier non-residential areas and avoid conflicts between users.

Effective lighting for these needs should be unobtrusive, avoid creating glare, and avoid excessive light which can harm the night sky and the health of people and landscaping. For this reason, maximum limits on lumens per site and hours of curfew apply to all non-residential properties in Aspen. Additional guidelines are as follows:

(b) *Light Output:* The upper lumen limits listed below should not be the design goal. The design goals should be to use the minimum light levels that meet the requirements of the task. The total allowable site lumens for non-residential property are based on the square footage of the facade and other elements of the developed structure, landscape buffer, and hardscape. Individual site lumen limits are as follows:

Total Site Lumens Allowed: Commercial Uses					
Lighting Requirement	**Unit**	**LZ0**	**LZ1**	**LZ2**	**LZ3**
Store Front Façade(s)	lm / sf of façade	n/a	4	8	16
Customer Entrance(s)	ea.	n/a	500	1,000	2,000
Service Entrance Facade	lm / sf of façade	n/a	1	2	4
Nighttime Service Loading	ea.	n/a	2,000	4,000	8,000
Tree and Landscape	lm / sf of façade	n/a	1	1	1
Parking Lot	lm / space	n/a	200	300	400
Gas Station Canopy*	lm / pump	n/a	4,000	8,000	16,000
Display Window Deduction	lm / sf of façade	n/a	-1	-2	-4

Table 4 - Total Site Lumens Allowed: Commercial Uses. Measured in lumens.

* *Gas Station:* Measured illuminance shall not exceed ten (10) footcandles average under the canopy.

(c) *Light for Orientation and Reassurance:* Vertical illuminance plays a critical role in allowing people to perceive the spatial perimeter and major obstacles in an area, as well as detect movement. This allows people to feel more confident navigating busier non-residential areas and also allows for threat detection at night. The design standards for this kind of lighting are detailed below.

(1) *Façade Lighting:*

a. The point light source must not be visible from adjacent properties.

b. Façade lighting for a mixed-use property is prohibited when above residential floors.

c. Non-Residential façade lighting must be turned off no later than curfew or after business hours, whichever comes later. To the greatest extent possible, when business hours extend after curfew, interior lights should be turned off.

d. Interior light escaping through windows is also seen vertically from the exterior perspective. Display window lighting will count towards the total allowable façade lighting.

(2) Trees, Gardens, and Landscape Lighting:

a. Tree and landscape lighting must be turned off during hours of curfew.

(3) *Walls, Fences, and Perimeter Barriers:*

a. Illumination of walls shorter than eight (8) feet is allowed within non-residential common areas.

Partially shielded luminaires for these applications are permissible if the light distribution is effectively contained by the targeted element (e.g. façade, sculpture, shrub), and if the total amount of partially shielded light does not exceed 20% of the total site lumen allowance or individual the luminaire limits listed below.

Individual Luminaire Limits (Vertical Illuminance)				
Luminaire Type	**LZ0**	**LZ1**	**LZ2**	**LZ3**
Low Voltage Landscape	n/a	205	430	525
Partially Shielded Flood??	n/a	630	1,260	2100
Fully Shielded U0 Down	n/a	630	1,260	2,100

Table 5 - Individual Luminaire Limits (Vertical Illuminance). Measured in lumens.

(c) *Light for Wayfinding and Pathways:* Changes in grade or terrain are more hazardous when visibility is poor. Stairways, curbs, raised pavement, potholes, and slippery surfaces are all examples of possible trip and fall hazards that can require lighting at night to navigate around safely in a non-residential area. The design standards for this kind of lighting are detailed below.

(1) *Driveway and Parking:* Outdoor lighting used to illuminate parking spaces, driveways, or maneuvering areas shall meet fully shielded requirements and be designed, arranged and shielded so that the point light source is not be visible from adjoining property lines or streets.

(2) *Entrances and Porte Cocheres:* Porte cochere and covered porch lighting for entrances and transfers is allowed. Luminaires mounted shall be aimed downward and installed such that the bottom of the luminaire or lens, whichever is lower, is recessed or fully cutoff and not producing any light above horizontal. All light emitted by an under-canopy fixture shall be substantially confined to the posts, façades and ground surface directly beneath the perimeter of the canopy.

(3) *Pathways, Stairs, and Steps:* This lighting shall be no taller than thirty-six (36) inches.

(d) *Light for Atmosphere and Enjoyment:*

(1) Outdoor Dining: Lighting patio and courtyard spaces with bistro/market/ping-pong style lights for outdoor dining is allowable provided the lights are fully-shielded and the bulbs are frosted in appearance.

(2) *Art, Monuments, and Fountain Features:* Lighting these features in non-residential areas is allowable provided the lighting is fully shielded and complies with hours of curfew.

(3) *Signage:* For more detailed information on allowable lighting for signage, please refer to Sec. *26.510.070 Sign Illumination* of Aspen's municipal code.

26.575.150.090 Park and Protected Space Lighting

(a) *Protected Areas (NDZ)*: No outdoor lighting is allowed within undeveloped backcountry, natural wilderness areas, or areas concerned with migration and habitat for birds and animals, or the preservation of dark sky. This restriction exists for environmental protection and conservation for both public and private land.

(b) *Rural Parks (Lz0)*: Very little outdoor lighting is required for rural park amenity and terrain safety during nighttime hours of operation. Elements such as restroom entrances, visitor centers, maintenance facilities, signage, and curbs, stairs, or other hazardous changes in grade may need illumination. Illuminance criteria for these applications should follow general requirements regarding, CCT, uplight, and light trespass within this ordinance, and ANSI/IES illuminance guidance for tasks within Lighting Zone 0 (Lz0). No outdoor lighting is allowed one hour after park hours.

(c) *Suburban (Lz1) and Urban Parks (Lz2)*: Varied in size, and situated amongst mixed use and non-residential zones, suburban and urban park users at night have expectations of outdoor lighting. Elements such as signage, restroom entrances, amenity, stages, landscape, artistic features, and curbs, stairs, or other hazardous changes in grade may need illumination. Illuminance criteria for these applications should follow general requirements regarding, CCT, uplight, and light trespass within this ordinance, and ANSI/IES illuminance guidance for tasks within Lighting Zone 1 (Lz1) or Lighting Zone 2 (Lz2). Suburban and urban parks should use just enough light for the tasks required, including transitional light levels from adjacent properties to foster pedestrian reassurance. Outdoor lighting should be turned off or dimmed by at least 50% one hour after park hours.

(d) *Recreational Parks*: These areas have special requirements for lighting at night to find a balance between the safety of users and protection of the environment.

(1) *Sport and Recreation Fields:* Lighting for sport and recreational areas that do not need to obtain a Special Event Permit, shall confine any illumination to the field, bleacher, track, or recreational area. Such lighting may sometimes need to exceed lighting zone illumination standards to meet requirements for play and safety per ANSI/IES RP-6 rules for amateur and recreational levels of play.

(2) Light trespass limits apply. Shielding and internal louvers to prevent light trespass, glare, and light emitted above sixty-two (62) degrees from the horizontal ground plane are required.

(3) Lighting shall be extinguished no later than one (1) hour after the event ends.

26.575.150.100 Special Use

(a) *Security:* Lights emitting infrared radiation used for security surveillance systems is permitted if they are fully shielded and aimed no higher than 70 degrees from below the horizon. Special review by the Planning and Zoning Commission may allow lighting of a greater intensity under the following circumstances:

(1) Multi-Family, Mixed Use, and Commercial common areas with increased density and activity may require increased illumination at primary points of entrances or exits. Light intensity shall not exceed five (5) foot-candles average at grade.

(2) Shielded flood lights controlled by a motion sensor must be limited to motion within the owner's property lines and turned off 5 minutes after motion was detected.

(b) *Lights located at Historic Landmark Sites or within the Historic Districts:* Luminaires that have a specific purpose for the illuminance of their historic area and are consistent with the time period and character of their historic structure may be exempt from the shielding, uplight, and light trespass requirements upon request and subsequent approval from the Historic Preservation Officer or Historic Preservation Commission. All lighting related to historic properties or located in a historic district shall be otherwise consistent with all other performance standards laid out in this ordinance.

(1) Historically approved fixtures that do not meet the general lighting or light trespass criteria of this ordinance shall be limited to 700 lumens per fixture and 10,000 lumens per acre.

(2) If new site lighting is needed to meet pedestrian safety requirements (e.g. stairs and egress), or an architectural or historical feature requires greater illumination, modern lighting techniques should not compete with the historic character of the property or convey a false sense of history (e.g. faux historic lights).

(c) *Decorative*: Lighting elements, such as shades with translucent, perforated patterns, and diffusers, may be exempted from the fully-shielded requirement provided they are less than 1,000 lumens and meet all other requirements of this ordinance and demonstrate a benefit for the community.

26.575.150.110 Miscellaneous Lighting Types

(a) Temporary Use:

(1) See Chapter 26.450 - Temporary and Seasonal Uses

(b) Special Events:

(1) See Chapter 14.20 - Special Event

(c) Construction:

(1) See Title 29, Engineering Design Standards.

(d) *Pool Lighting:*

(1) When approved by permit, underwater pool, spa, and pool deck lighting is allowed. Such lighting shall not exceed the minimum level needed to meet adopted building codes. This lighting is not part of the total site lumen limit.

26.575.150.120 Enforcement and Penalty

(a) Enforcement and Penalty: Any lighting that does not meet the provisions of this ordinance will be considered a violation. Any alleged violation of this ordinance will be investigated, enforced, and penalized as allowed in Sec. 2.02.120. - Uniform enforcement of City regulations of the Aspen Municipal Code.

26.575.150.130 Definitions

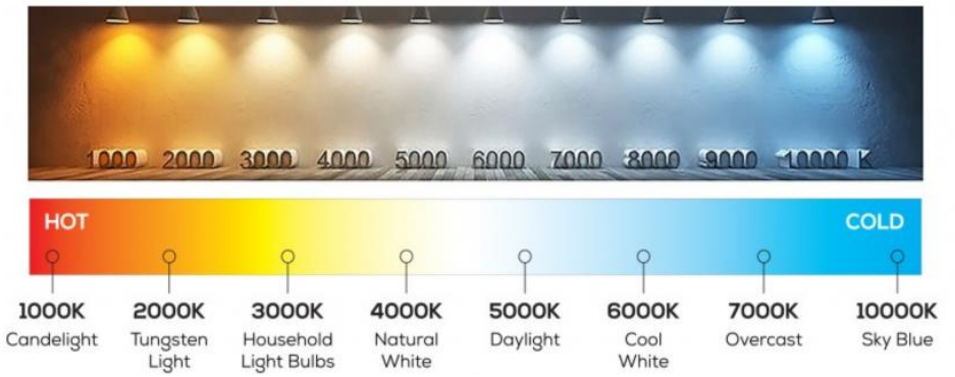
(a) *Definitions*: Terms being used throughout this text are defined here for clarity.

(1) **BUG (Backlight, Uplight, Glare) Ratings:** The IES TM-15 luminaire classification system describing the amount and location of light being emitted from a luminaire.

(2) **Color Rendering Index (CRI)**: A quantitative measure, on a scale of 0 to 100, of artificial light's ability to render an object's natural color, with 100 being a good match for natural light.

(3) **Continuous Lighting**: A street lighting system made up of regularly spaced luminaires along the street. Criteria typically defines minimum and maximum illuminance values and overall uniformity along the lighted area.

(4) **Correlated Color Temperature (CCT)**: Measured in degrees Kelvin (K). A specification for the color appearance of the light emitted by a lamp.



(5) **Diffusion:** The scattering of light by reflection or transmission when light strikes an irregular surface, such as a frosted lens.

(6) **Efficacy:** Measured in lumens per watt (lm/w), luminous efficacy is a measure of how well a light source produces visible light for the amount of energy consumed.

(7) **Façade:** The square footage of a structure's vertical and horizontal dimensions as viewed in the elevation view. Also referred to as the "vertical surface area".

(8) **Façade Variation:** Shifts in the plane of walls, setbacks, reveals, overhangs, in order to create variations within a building's façade.

(9) **Fixture height:** Height of the fixture shall be the vertical distance from the ground directly below the centerline of the fixture to the lowest direct light emitting part of the fixture.

(10) **Footcandles:** A unit of illumination equal to one (1) lumen per square foot.

(11) **Fully shielded:** Light fixtures shielded or constructed so that no light rays are directly emitted by the installed fixture at angles above the horizontal plane as certified by a photometric test report. The fixture must also be properly installed to effectively down direct light in order to conform with the definition. Examples of fully shielded light fixtures:



(12) **Glare**: The visual sensation created by luminance (or brightness) that is significantly higher than the surrounding luminance that the eyes are adapted to, causing annoyance, discomfort, or loss in visual performance and visibility (disability glare).

(13) **High intensity discharge light source (HID):** Light sources characterized by an arc tube or discharge capsule that produces light, with typical sources being metal halide, high pressure sodium and other similar types which are developed in accordance with accepted industry standards

(14) **Illuminance**: Measured in Footcandle (Fc). The density of light falling onto a surface. Commonly measured in the horizontal and vertical planes.

(15) **Light Pollution**: Stray and uncontrolled light, directly from a luminaire or reflected from a surface, that missed its target. Light emitted upward increasing skyglow is a popular example.

(16) **Light Trespass**: Measurable light extending beyond the boundary of its intended use without permission, causing annoyance, loss of privacy, or other nuisances. Often measured in footcandles.

(17) **Lumen**: The measure of visible light (luminous flux) emitted from a light source.

(18) **Luminaire**: A complete electric light unit including light source, housing, optics, and driver.

(19) **Lux:** The unit used to measure illuminance. One lux is equal to one lumen per square meter (lm/m2).

(20) **Non-Continuous Lighting**: A non-continuous street lighting system, lighting only conflict areas such as intersections, crosswalks, and other hazards.

(21) **Non-Shielded Luminaires:** Light fixtures that allow too many light rays to emit upwards, backwards, or forward in a way that can cause glare. Examples of non-shielded light fixtures:



(22) **Point light source:** The exact place from which illumination is produced (e.g. a light bulb filament or LED package) even when behind a clear lens.

(23) **Spectrum:** A range of electromagnetic radiation that includes visible wavelengths between 380 and 700 nanometers (Violet to Red). Research indicates wavelengths between 460 and 480nm can be harmful to humans at night if the dosage is too high for too long.

(24) **Vertical Illuminance:** The density of light falling onto a vertical surface.

(25) **Watt (W)**: A unit of power.